

In the Matter of )  
 )  
Amendment of Part 90 of the Commission's Rules ) WP Docket No. 16-261  
To Improve Access to Private Land Mobile )  
Radio Spectrum )  
  
To: The Commission

MRFAC, Inc. (“MRFAC”) hereby replies to the Comments of the Association of American Railroads (“AAR”) in this proceeding. In particular, MRFAC wishes to address the AAR proposal to allow use of high-powered, 30-watt boosters on channels adjacent to, and even overlapping, those used by manufacturers and others. In support MRFAC submits the following:

AAR urges that the Commission codify the terms of the 2014 waiver so as to allow the use of 30 watt fixed boosters (versus the five watts allowed by Rule 90.219) to amplify signals from the front to the rear of long trains.<sup>1</sup> AAR goes on, to argue, however, that codification should include allowance of these boosters, not just on the channels in the inner portion of the band, but also on the outer railroad channels adjacent to industrial/business users, i.e. 452/457.9000 MHz and 452/457.96875 MHz -- channels expressly excluded from the scope of the waiver.

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### Discussion

MRFAC has no issue with the railroad desire for relief in rugged/mountainous terrain; MRFAC's concern relates to the use of the 30-watt boosters on the outer channels in rail yards and terminal areas, areas which AAR has expressly not excluded from the scope of its request.<sup>2</sup> Rule 90.35, note 59 provides that

“on a secondary basis this frequency may be assigned for remote control for all types of locomotives and within a railroad yard or terminal area, for remote control of cab indicator devices placed with a locomotive to give visual signals to the operator of the locomotive.”

(emphasis added).

AAR's Comments fail to address, much less resolve, MRFAC's concern about 30-watt booster use in and near rail yards and terminal areas -- areas where manufacturing plants are often located. Marshalling the long trains referenced by AAR can take hours, if not days. During this time, use of interfering high-powered boosters could effectively shut down a manufacturing assembly line, the cost of which in larger plants like a steel mill, an automobile assembly plant, or an aerospace manufacturing facility, exceeds thousands of dollars per minute.

AAR argues the channels are used by railroads “in any event, giving railroads the incentive to avoid interference.”<sup>3</sup> But the predicate is not correct: The channels at risk are ones adjacent to railroad frequencies, not the railroad frequencies themselves; hence, there is no such incentive. Moreover, the fact that AAR, which exists for the benefit of railroads, might

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<sup>2</sup> See Reply Comments of AAR in WT Docket No. 14-98 at page 3 (“terrain barriers that railroads seek to overcome are present in non-remote areas, including within rail yards and terminal areas”).

<sup>3</sup> AAR Comments at pages 4-5.

coordinate railroad channel use between and among railroad users, is of no comfort to the many non-railroad licensees occupying adjacent, non-railroad frequencies.

The AAR Comments further argue that MRFAC has not provided a technical basis to demonstrate a risk of interference. Attached is an Engineering Statement from Peter Moncure, MRFAC's technical consultant, demonstrating the risk of interference to non-railroad licensees on the adjacent channels -- many of which utilize low power, two watt systems pursuant to Rule 90.35 note 84 -- from 30-watt railroad boosters on adjacent, even overlapping channels.

Evaluated in this light, the proposal for booster use on the outer channels, without more, is groundless and should be denied: The 2014 waiver should be codified as urged by MRFAC as well as the Land Mobile Communications Council. However, in the event the Commission should see fit to consider the merits further, MRFAC offers a possible alternative; namely, a requirement that any proposed high-powered booster use on these channels be prior coordinated with adjacent channel industrial/business licensees, or an eligible coordinator(s) for such licensees, whenever the booster's interfering contour would overlap an I/B licensee's service contour. *Cf.* Rule 90.35(b)(2)(iii).

### **Conclusion**

For the reasons set forth above, MRFAC urges that the Commission codify the 2014 waiver, and thereby preclude high-power booster use on the two outer channel pairs (452/457.9000 MHz and 452/457.96875 MHz). If the Commission should nevertheless see fit to entertain such use, prior coordination should be required for the protection of adjacent channel industrial and business users. As private land mobile spectrum becomes increasingly congested,

this is a straightforward 'good neighbor' requirement -- especially when the proponent wants a change in rules for its benefit that risks injury to others in the neighborhood.

Respectfully submitted,



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*Its Counsel*

December 22, 2016



## ENGINEERING STATEMENT

I, Peter W. Moncure, hereby declare as follows:

This Engineering Statement is offered in support of the Reply Comments being filed by MRFAC, Inc. in connection with the railroad proposal to use high-powered boosters on channels immediately adjacent to those used by manufacturers and numerous other business and industrial licensees. My qualifications to offer this Statement are a matter of record with the Commission.

Interference caused by locating fixed high-power (30 watt) booster transmitters on the high side (mobile frequency) of UHF repeater pairs will vary depending on the channel adjacency, modulation type and location of the offending transmitter versus the victim receiver.

While the Association of American Railroads ("AAR") has proposed to locate the boosters in "rugged terrain" where it is necessary to support communication between the end of a train (the "mobile" or high side of the UHF pair) and its distant locomotive (the "base" or low side of the UHF pair), no definition of that qualification has been proposed; on the contrary, the AAR has insisted that it wants the ability to operate the boosters in and near rail yards and terminal areas as well. See Reply Comments of AAR in WT Docket No. 14-98, at page 3. This obviously includes switchyards, densely populated urban areas, and industrial zones.

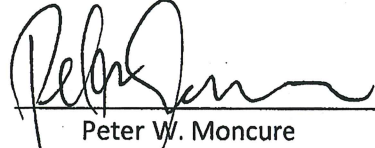
The railroad transmissions would constitute "base-to-mobile" interference, in that they would be heard by non-railroad receivers on adjacent channels, the antennas for which are often elevated. Using as an example the lower band edge railroad frequency (457.900 MHz), a 30 Watt transmitter would degrade the performance of an adjacent channel (457.89375 MHz) industrial/business user, presumably operating with a NXDN protocol, at a distance of up to 50 kilometers. On the upper adjacent band edge railroad channel (457.96875 MHz), degradation to the adjacent 12.5 kHz bandwidth 457.975 MHz industrial/business channel could occur up to 48 kilometers away. That interference would be even worse in those cases where the industrial/business licensee is operating with low power per Rule §90.267. By way of example, a plot of interference from a proposed booster with ERP of 30 watts at 10 meters AGL along a rugged and curved stretch of track in northwest Washington State is appended, with the blue and red colors representing interference to the lower adjacent (457.89375 MHz) channel, based on the LMCC agreed value of 49 dBμ F(50,10), adjusted for elevated receiver height. The red color represents interference at 51 dBμ to the upper adjacent channel (457.975 MHz). Interference in urban areas would be greater due to proximity.

Since the railroad boosters would be fixed, interference would always be present each time the booster was activated, regardless of the location of the "mobile" triggering the activation. It would be difficult to find such an interference source.

Given the interference risk presented, the Commission should codify the terms of the 2014 waiver which expressly excluded use of the high-powered boosters on the outer-most channels. In the alternative, a rule-of-the-road requiring prior coordination with adjacent channel licensees (or an eligible non-railroad coordinator) whose service contours would be overlapped by the proposed railroad interfering contour, should be required at a minimum. This would be analogous to Rule §90.35 (b)(2)(iii).

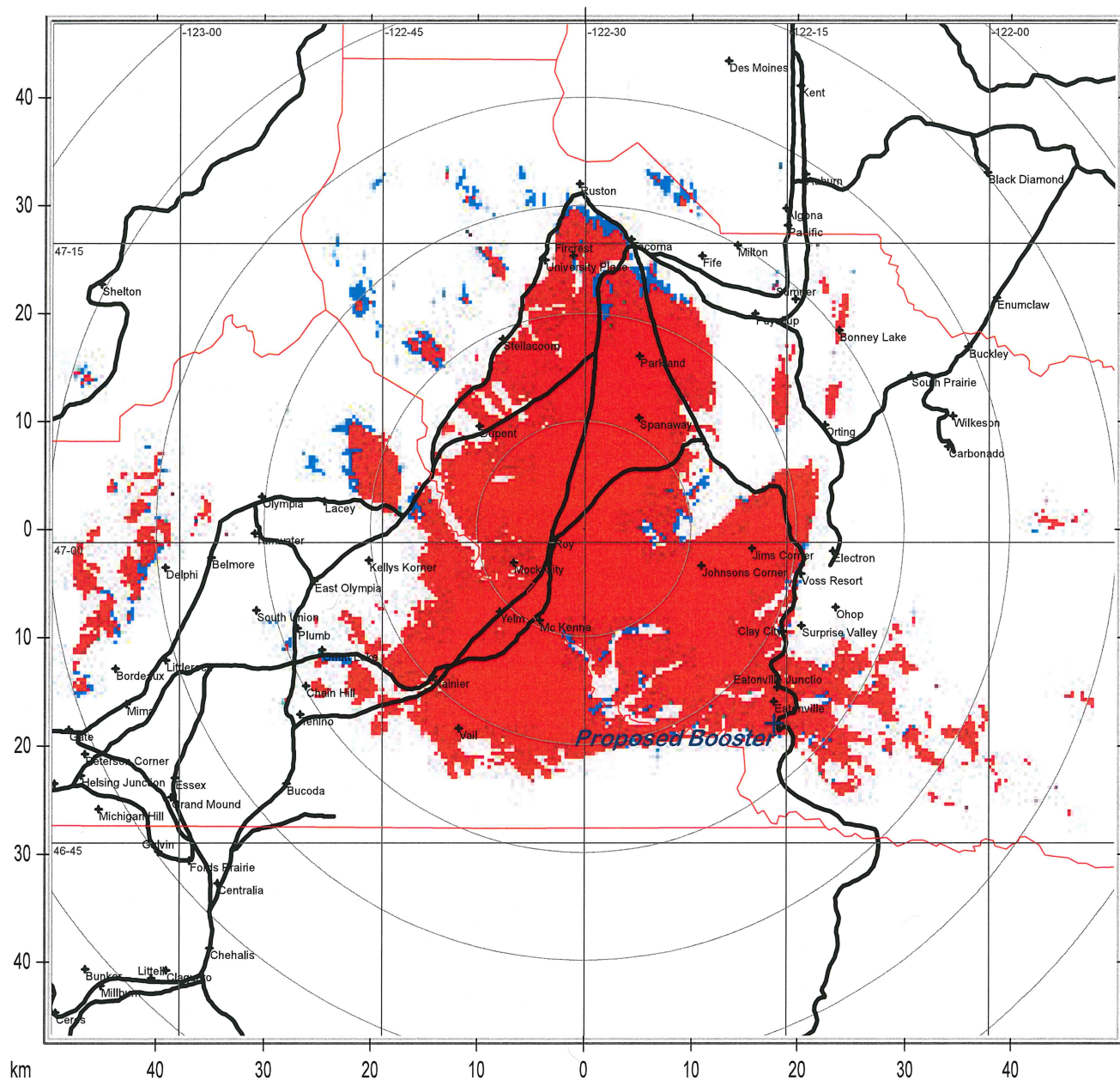
I have reviewed the Reply Comments, and they are true and correct to the best of my knowledge and belief.

Executed under penalty of perjury, this 20<sup>th</sup> day of December 2016.

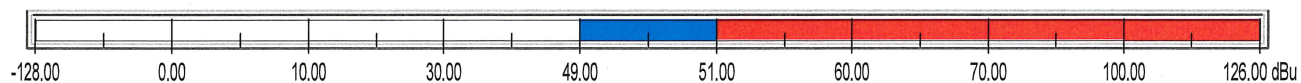


Peter W. Moncure

## Plot of Proposed Railroad Booster Interference



Longley-Rice, 10% Time, Receivers 30M AGL, 10 Kilometer Radius Scale



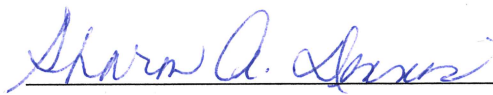
County Borders   State Borders   Railroads   Lat/Lon Grid

Map Scale: 1:577760   1 cm = 5.78 km   V/H Size: 93.60 x 99.30 km

CERTIFICATE OF SERVICE

I, Sharon A. Dennis, hereby certify that I have caused the attached Reply Comments of MRFAC, Inc., to be deposited in the U.S. Mail, first-class postage prepaid, this 22<sup>nd</sup> day of December 2016, addressed as follows:

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Sharon A. Dennis